

ON SOME UNDESCRIBED BEES AND WASPS CAPTURED BY
LIEUT.-COL. C. G. NURSE IN INDIA.

BY P. CAMERON.

ANTHOPHILA.

Halictus simlaensis, sp. nov.

Black; the head and thorax thickly covered with white pubescence and closely punctured; the area on the median segment at the base is irregularly striated; the striæ straight in the middle, oblique at the sides; abdomen long and slender, smooth, shining impunctate, the segments not depressed nor constricted; legs black, the calcaria white, the apex of the clypeus broadly yellow. ♂

Length, 7-8 mm.

Hab.—Simla.

Antennæ if anything, longer than the abdomen, black; the flagellum in part brownish beneath and the joints are slightly dilated below. The labrum and clypeus are covered thickly with white pubescence; the apex of the clypeus is broadly lemon-yellow; the eyes are long and distinctly converge below; the hinder ocelli are separated from each other by a much greater distance than they are from the eyes. Thorax closely punctured; there is a narrow longitudinal furrow on the sides of the mesonotum. The striæ on the median segment are irregular, especially those in the middle. Legs black, the apices of the tarsi pale, the calcaria white, the forelegs are piceous in front, they are thickly covered with white hair, which is thickest on the tarsi. Abdomen long; the basal 3 segments together are as long as the head and thorax united, it is smooth and shining, the basal segments are narrowly brownish at the apex. Wings clear hyaline, the stigma and nervures are dark fuscous; the 3rd cubital cellule at the top is shortly, but distinctly, narrower than the 2nd; tegulæ black, piceous in the middle.

Andrena arima, sp. nov.

Black; the head covered with long white hair, the pro and mesonotum with the scutellum thickly covered with long bright fulvous hair; the basal segment of the abdomen covered with long white hair, the apices of the 2nd 3rd and 4th segments banded with white pubescence, the apical segments above thickly covered with long, plumose, pale fulvous hair; the legs thickly covered with white hair, the hair on the underside of the metatarsus has a fulvous tinge; the wings clear hyaline, the stigma and nervures are blackish. ♀

Length 8-9 mm.

Hab.—Simla.

Antennæ entirely black; clypeus shining, covered with longish white hair, the apex widely depressed almost furrowed and broadly rounded. The labrum is obliquely narrowed towards the apex, the apex in the middle is roundly and deeply incised, the incision forming almost a semicircle; it is smooth and shining with the sides and apex fringed with long pale golden hair. Mandibles black, piceous at the apex; their lower side fringed with pale hairs.

Mesonotum opaque, alutaceous and with a shallow furrow down the centre. Scutellum shining, its base almost bare. Median segment opaque, closely and minutely punctured all over, the basal area is not clearly defined, its base is irregularly, longitudinally striated. Abdomen shining, impunctate; the basal segment is broadly and deeply furrowed on the basal half, the ventral segments are fringed with long pale hair, their apices are bordered with clear white hair.

In Bingham's arrangement this species, if anywhere, would come into his section *B*, or, better still, it might form a new one:—the area on the median segment not clearly defined, its base irregularly, longitudinally striated.

Andrena caroli, sp. nov.

Black; the apices of the abdominal segments, narrowly but distinctly, the tibiæ and tarsi rufo-testaceous; the head and thorax thickly covered with long white hair; the wings hyaline, the stigma rufo-testaceous, the nervures darker. ♂

Length, 12-13 mm.

Hab.—Simla.

Head densely covered with long white hair; the sides have the hair darker coloured, as has also the hinder part of the vertex; the front is distinctly, and somewhat strongly, punctured; the sides have the punctures smaller, the vertex is less strongly punctured. The clypeus, except at the apex, is strongly punctured; the labrum is smooth and shining in the middle, where it is triangularly incised, the sides are depressed and are strongly aciculated, almost punctured. Mandibles black, piceous towards the apex; the middle is deeply furrowed. Mesonotum strongly, closely and uniformly punctured; in its centre is a narrow longitudinal furrow. The basal area of the median segment is closely punctured; on the apical slope is a large, deep, smooth pyriform depression. The 1st and 2nd transverse cubital nervures are straight, not angled at the bottom or middle, as is usually the case; the 3rd cellule at the top is slightly longer than the 2nd, the 2nd recurrent nervure is received shortly behind the apical third of the cellule. Legs black; the tibiæ and tarsi have a piceous or testaceous tinge; the apical joint of the tarsi is clear rufo-testaceous; the spurs are pale testaceous. The basal segment of the abdomen is covered with soft white hair; the 2nd to 5th segments have their apices fringed narrowly with white hair, the part behind this is piceous; the 6th segment is brownish.

Comes near to *A. mephistophelica*, Cam. The 2nd cubital cellule is smaller than usual; and noteworthy, is the straight, oblique cubital nervure.

Andrena punjaubensis, sp. nov.

Black; the pubescence cinereous, that on the mesonotum tinged with fulvous, on the last 2 dorsal abdominal segments long and black; wings almost hyaline, the nervures and costa black; the tegulæ piceous. Metanotal area closely finely punctured, narrowly furrowed down the middle. ♀

Length, 10 mm.

Hab.—Ferozepore—March.

Clypeus somewhat strongly, closely punctured, shining, almost bare in the

centre, the apex transverse, depressed, the sides projecting into broad teeth. Labrum almost semicircular, smooth, not furrowed, the apex fringed with long golden hair. Pro- and mesothorax closely punctured, the latter more strongly than the former, the latter with a narrow smooth furrow down the middle of basal half. Metanotal area not very clearly separated, the rest of the metanotum more strongly punctured, the punctures round and clearly separated. Abdomen closely, minutely punctured, the pygidium bare, aciculated, the apex bluntly rounded. The 2nd abscissa of the radius is not much longer than the 3rd; the 1st recurrent nervure is received in the middle of the cellule. The hair on the hind tibiae and tarsi is tinged with fulvous.

There is a furrow on the apical slope of the metanotum; it is wide, becomes wider towards the apex and is moderately deep.

Belongs to Bingham's Section A. a. It may be known from the two species included in it by the absence of red or yellow from the abdomen.

Andrena ferozeporensis, sp. nov.

Black; the apices of the 4 anterior tarsi, the whole of the posterior and the posterior tibiae rufo-testaceous; the antennae from the 3rd joint, except on top, dark rufous. Wings clear hyaline, the costa and stigma dark testaceous, the nervures blackish; the 2nd abscissa of radius about one-fourth longer than the 3rd, the 1st recurrent nervure is received at the base of the apical 3rd of the cellule. Metanotal area closely, finely punctured. Pygidium broadly roundly raised in the centre, narrowed towards the apex, which is reddish; the sides are flat. Pubescence long and white, the apices of the abdominal segments testaceous and covered with white pubescence; the back of the abdomen has a slight violaceous tinge. ♂

Length, 10 mm.

Hab.—Ferozepore—March.

Clypeus shining, distinctly punctured, more closely above than below and sparsely striated there. Labrum opaque, fringed on the sides and apex with golden pubescence, the centre with rounded tubercles. Front and vertex opaque, alutaceous. Mesonotum with a narrow furrow on the basal half; the scutellum is more strongly and distinctly punctured than it. There is no furrow on the apical slope of the metanotum. Apical abdominal segments finely, closely punctured.

Belongs to Bingham's section A. b., near *A. mephistophelica*, Cam.

Megachile striolata, sp. nov.

Black; the pubescence white; the metanotal area distinctly bordered by a keel round the apex, stoutly, closely, regularly striated; mandibles bidentate, the apical tooth longer and more sharply pointed than the other; the space behind them straight, slightly oblique, not dilated; wings clear hyaline, the nervures and stigma black, the 1st abscissa of radius about one-fourth shorter than the 2nd; the 1st recurrent nervure widely distinct from it—about two-thirds of its length; the 2nd touching the 2nd transverse cubital. ♀.

Length, 5 mm.

Hab.—Simla—September.

Punctuation close, distinct. Head a little wider than the thorax ; the clypeus roundly convex, its apex transverse : occiput transverse. Basal slope of abdomen surrounded by a keel, the apices of the segments with narrow bands of white pubescence on all of them, including the last ; the scopa white, very slightly tinged with fulvous. The central part of the metanotum is very smooth, bare and shining.

Comes close to *M. parvula*, Cam, (Willanchr. Mem. xli, No. 4, 1897, p. 135) which may be known from it by the apex of the mandibles being rufous, with the teeth much broader, less clearly separated, by the metanotal area having the striæ much stronger and more widely separated, more depressed and without a stout apical bordering keel ; the keel bordering the base of the abdomen is stouter and much more distinct and the 1st recurrent nervure is nearer the transverse cubital. The other little species, e. g. *M. cuthena*, *M. punjabensis* and *M. anonyma* have not the metanotal area striated.

Megachile heterotricha, sp. nov.

Black ; the hair on the head, thorax and basal 2 segments of abdomen fulvous, that on the metanotum and base of abdomen paler, the hair on the vertex mixed with black, the neutral scopa fulvous, black laterally on the basal 2 segments, black entirely on the others ; the hair on the legs pale fulvous, on the underside of the middle tarsi rufous, on the hinder tarsi black. Wings hyaline, their apex slightly infuscated, the nervures black. ♀.

Long h, 13 mm.

Hab.—Simla—August.

Face closely strongly, the clypeus more strongly, but not so closely, punctured, the apex of the latter smooth, depressed in the middle and not quite transverse ; being shallowly incised. Mandibles bidentate, the apical tooth longish triangular, the subapical shorter, broadly rounded ; it is followed by a broad rounded swelling, with a small depression in the centre at the apex ; the punctuation is close at the base below, more scattered elsewhere. Abdomen closely punctured, the punctuation becoming closer and stronger towards the apex ; the last segment large, depressed towards the apex and with a short longitudinal keel before the depression ; there are no distinct transverse furrows. Base of metatarsus nearly as wide as the apex of tibia. The 1st abscissa of radius a little shorter than the 2nd.

The ♂ has the fore coxæ unarmed, the apical abdominal segment is broadly bilobate.

In Bingham's system this species would come near *M. bhuvana*, a much larger species (20 mm.)

Megachile s. macreticulata, sp. nov.

Black ; the surface of the front, face and clypeus hidden by long white pubescence, the white pubescence on the thorax is as long but not so dense, the basal 5 abdominal segments with a band of white depressed pubescence on their apices, the basal segment having also longish white hair, the hair on the

ventral surface long, white, moderately dense. Legs with white pubescence the apical tarsal joint pale rufous, the spurs pale, the fore coxæ with stout teeth. Wings hyaline, the costa and nervures fuscous. Apical abdominal segment with 9 teeth, the central is broad, almost square, with the apex more or less incised, the others longish, sharp-pointed, the outer shorter and blunter than the others. Flagellum brownish, ♂

Length, 10 mm.

Hab.—Ferozepore, Punjab.

Front and vertex closely, somewhat strongly, punctured; the sculpture and form of the clypeus is hidden by the dense hair. Mesonotum closely punctured, the punctures round, forming almost reticulations. Metanotal area almost smooth. Abdominal segments finely, closely punctured, the last more strongly than the others, its ventral armature in the form of 3 stout teeth, of which the central is longer and narrower, the lateral broad at the base, becoming gradually narrowed to a fine point, the outer sides rounded. There are 2 large wide mandibular teeth, rounded at the apex, the apical is much longer than the others.

Allied apparently to *M. albibrous*, Sm., but the form of the abdominal segments has not been described.

Megachile ferozeporensis, sp. nov.

Black; the coxæ, femora and basal slope of abdomen piceous; the pubescence on the head, thorax, apex of dorsal abdominal segments and base of scopa clear white, the apical half of the scopa white mixed with bright red; wings clear hyaline, the tegulæ and costa piceous, the nervures black. Apex of mandibles rufous, with 2 large teeth, the 2nd triangular and shorter than the apical which is broadly rounded at the apex.

Length, 7 mm. ♀, ♂ almost 6 mm.

Hab.—Ferozepore, Punjab—April.

Clypeus closely, somewhat strongly, punctured, the centre of the face smooth, shining. Thorax closely, distinctly punctured, the metanotal area finely aciculated, the rest of the metanotum less closely punctured than the mesonotum. Abdomen less strongly punctured than the thorax, the puncturation becoming weaker towards the apex. Beyond the extreme base the metatarsus is not much narrower than the apex of tibiæ.

The ♂ is smaller, has the antennæ longer (as long as the head and thorax united), the apical abdominal segment ends in 4 irregular teeth, of which the central 2 are longer and sharper, the space behind them being depressed.

Megachile simlaensis, sp. nov.

Black; the pubescence on the head, thorax, and base of abdomen white, the apices of the 2nd and following dorsal abdominal segments with narrow white hair bands, the rest of them covered with black hair, which is longest on the apical segments; the pollen-brush bright red, paler on the basal segment; the hair on the legs white, reddish on the innerside of the hind tarsi; fore calcaria pale, the hinder testaceous; wings hyaline, the apex slightly violaceous; the

nervures black. Mandibles with a longish triangular apical and 2 longish bluntly rounded teeth. ♀.

Length, 14 mm.

Hab.—Simla—May.

Head as wide as the thorax, above closely, distinctly punctured; the face sparsely punctured in the centre, closely laterally, the clypeus somewhat strongly punctured, with an irregular smooth line down the middle, the depressed apex being also smooth, its centre projecting somewhat. Mandibles, except at the apex, covered with longish punctures, which run into each other. The thorax closely, distinctly punctured, the metanotum less strongly than the rest, its area smooth, opaque. Abdomen closely, finely punctured, without distinct transverse depressions. Base of hind metatarsus nearly as wide as the apex of tibiæ; the apex of 5th tarsal joint narrowly and the claws rufous.

The pygidium is large, is more closely and distinctly punctured than the other segments, is turned up at the apex and has no median impressed line. The apices of the 2nd and 3rd abdominal segments are broadly, not deeply, depressed. The femora are castaneous brown below. The sides of the 2nd and following abdominal segments are fringed, next to the pollen brush, with long black hair. Occiput slightly, broadly, roundly emarginate. Allied to *M. confuncta*, Sm.

Megachile melanoneura, sp. nov.

Black; the pubescence on the head, mesonotum, upper part of mesopleuræ and base of abdomen, pale fulvous, on the rest of the body, including the ventral surface, it is much paler, almost white, except on the outer edges of the ventral surface, the last segment above and below and on the apices of the 2nd to 4th, where it is black; the pubescence on the legs pale fulvous, reddish on the underside of the metatarsi. Wings hyaline, the nervures black. ♀

Length, 16-17 mm.

Hab.—Simla—May and August.

Mandibles with 3 short, broad blunt teeth, the apical longer and more sharply pointed than the others and a shorter bluntly rounded inner one. Front closely, the vertex more strongly and more widely punctured. Pro- and mesothorax closely punctured, the post-scutellum and metanotal area almost smooth, the rest of the latter weakly punctured. The head is as wide as the thorax in the ♀, in the ♂, a little wider than it. Abdomen closely, not very strongly punctured; in the centre of the 2nd segment is a deep, slightly curved furrow and there is a more indistinct one on the third. Shortly beyond the base the hinder metatarsus is as wide as the apex of tibiæ; the calcaria pale fulvous.

What Col. Nurse regards as the ♂ of this species has the anterior tarsi greatly dilated, white, the outer edge with a long, dense hair fringe, the inner side at the base with a much shorter hair fringe, which is white above, white on the inner, black on the lowerside below; the fore tibiæ are much dilated, white, streaked with brown below; the teeth on the fore coxæ are about four times

longer than wide, of equal width rounded at the apex. The hair all over is long and dense; on the back of the abdomen it is pale fulvous, below it is white. The last abdominal segment in the centre, is widely and deeply depressed, and is closely rugosely punctured, there is in its centre, a slight shallow curved border, with a short, blunt tooth on either side, outside it are two longer, more sharply pointed teeth. The last ventral segment is also widely and deeply depressed in the middle; the apex of the penultimate is raised, almost trilobate in the centre, this part being bordered by a stout tooth.

In Bingham's table this species comes near *M. penetrata*, Sm.; in that species the vertex, mesonotum and scutellum are bare of pubescence; Smith calls the nervures ferruginous, while in the present species they are black; Bingham described the wings as "light flavo-hyaline", in my species they are hyaline, slightly clouded at the apex; the latter author calls the pollen-brush "bright fulvous."

Megachile inepta, sp. nov.

Black; the pubescence on the front, vertex, mesonotum and base of abdomen pale fulvous; the abdominal segments with narrow bands of bright reddish fulvous pubescence on their apices, the pubescence on the face, clypeus, sides and back of head, pleuræ sternum and on the basal 3 ventral segments, white, on the apical ventral segments, the white is distinctly tinged with fulvous; wings hyaline, the nervures black. Mandibles bluntly bidentate, the part behind the teeth broadly, roundly dilated; the puncturation strong, the base covered with a dense silvery pile. The pubescence on the legs white, on the underside of the hinder metatarsus fulvous; the base of the hind metatarsus about one-third narrower than the apex of the tibiae.

Length, 13 mm.

Hab.—Simla—September.

Head as wide as the thorax. Face and clypeus strongly punctured, the apex of the face with a smooth line, from the centre of which another smooth line runs half way down the centre of the clypeus, the apex of which is rough and transverse. Metanotal area coarsely aciculated. First abscissa of radius not quite one-fourth shorter than the second.

This species is not unlike *M. subfusca*, Cam., of which I only know the ♂, I do not consider them to be sexes of one species, *e. g.* *subfusca* has the stigma testaceous, the basal abscissa of the radius is shorter compared with the 2nd, the wings are not clear hyaline, but distinctly infuscated towards the apex, the apical mandibular tooth is much longer compared with the subapical and the puncturation on the basal abdominal segments is not nearly so strong.

Megachile punjabensis, sp. nov.

Black; the pubescence clear white, the dorsal abdominal segments with narrow apical bands of clear white pubescence, the scopa white, the apica half mixed with red; wings clear hyaline, the costa and stigma piceous, the nervures black. Mandibles tridentate, the apical blunter, larger, more rounded than the others, which are triangular. Flagellum for the greater part piceous.

Length, 5 mm.

Hab.—Ferozepore—March and April.

The puncturation on the clypeus is less close than it is on the front and vertex ; there is a narrow smooth band on its apex. Puncturation on the thorax close, distinct, on the pleura almost running into reticulations. Base of hind metatarsus hardly half the width of apex of tibiæ ; the spurs and tarsal spines are white ; the apical 2 tarsal joints and the claws reddish.

The ♂ has the antennæ as long as the head and thorax united ; its apical segment is densely covered with white pubescence, in the centre are 2 stout teeth separated by a semicircle, on either side of these are 2 short teeth, with a blunt tubercle beyond them ; the fore coxæ are armed with stout, bluntly pointed teeth.

DIPLOPTERA.

Odynerus rufo-bimaculatus, sp. nov.

Black ; a broad, curved mark on the sides of the upper two-thirds of the clypeus, a dagger shaped mark over the antennæ, its lower part distinctly narrowed, underside of antennal scape, a line on the upper half of outer orbits, an almost interrupted line on the pronotum, roundly narrowed on the sides behind, an irregular mark below the tegulæ, the base and apex of the latter, a longish line rounded on the innerside, on the sides of the scutellum, a squarish one on the sides of post-scutellum, a narrow line on the sides of the 1st abdominal segment, a wider, trilobate one on the 2nd, a short, bilobate one on the centre of the 3rd and 4th and a shorter, wider curved one on the 5th and the apex of the 2nd ventral, pale yellow. Wings clear hyaline, the stigma brown, the nervures blackish ; the apex of the clypeus and 2 large spots near the centre of the 1st abdominal segment rufous, legs red, the middle coxæ below, the 4 anterior tibiæ below and the tarsi pale yellow.

Length, 7 mm.

Hab.—"India". In my collection.

Clypeus slightly longer than wide, the lower two-thirds of the centre keeled on either side, the apex clearly separated, transverse. Underside of flagellum light orange-brown. Head and thorax closely, not very strongly, punctured. Base of thorax almost transverse, the sides not projecting ; apex of post-scutellum smooth, gradually narrowed to a blunt point, sides of metanotum broadly rounded.

Allied to *O. humbertianus*, Sauss, which has the 2nd abdominal segment tuberculate near the base in the centre and laterally at the apex with a smaller tubercle. In the present species the depression on the metanotum becomes gradually wider towards the apex ; the apical teeth on the metanotum are large, triangular, as wide at the base as they are long. The puncturation on the clypeus runs into striæ at the apex. The frontal mark varies in form, and the reddish marks on the base of the abdomen vary also in size and form.

Odynerus (Ancistrocerus) foeriscutis, sp. nov.

Black; the clypeus, mandibles, except the upper and lower edges, and the apex, a line on base of pronotum, sometimes 2 marks on post-scutellum, and lines on the apices of the basal 5 abdominal segments above and below, bright lemon-yellow; the apices of the 4 anterior femora broadly, of the posterior more narrowly and the tibiæ and tarsi of a paler yellow; under-side antennal scape yellow, of the apical 3 or 4 joints and the hook reddish-brown. Wings iridescent, fuscous, the apex distinctly violaceous, the nervures black. Basal abdominal segment with a stout transverse keel, ♂.

Total length, 9 mm.

Hab.—Simla—August.

Clypeus longer than broad, roundly convex, sparsely, strongly punctured, its apex with a rounded shallow incision; sparsely covered with long, pale pubescence front and vertex closely, strongly, punctured, thickly covered with long brownish pubescence. Base of thorax almost transverse, the outer edges forming blunt, rounded teeth; apex of mesonotum depressed. Apex of scutellum with an oval fovea, or depression in its centre; post scutellum more rugosely punctured than the scutellum, its apex in the middle roundly projecting. There is a wide punctured furrow below the tegulæ; from its apex an oblique one, not quite so distinct, runs to the base of the pleuræ. The sides of the metanotum are bluntly rounded, and the base at the sides is reticulated at the apex. The keel on the 1st abdominal segment is crenulated at the apex; the 2nd segment is as wide as long, its sides are rounded.

The antennal hook reaches to the apex of the joint; it is stout and curved. Tegulæ dark yellow, fuscous in the centre.

Belongs to Bingham's Section A.; it cannot be confounded with any of the described species of the group.

Odynerus ornaticaudis, sp. nov.

Black, the clypeus, except for a large black mark in its centre, rounded above, gradually narrowed below, placed nearer the bottom than the top, a spot, slightly longer than wide, on the front, the eye incision entirely, base of mandibles, a line on the upper half of outer orbits, a large triangular mark on the basal half of the pronotum, a conical mark under and in front of the tegulæ, a conical mark on the sides of the scutellum, the greater part of the post-scutellum, the mark incised in the middle at the base, the sides of metanotum broadly, a line, roundly dilated at the base, on the apex of 1st abdominal segment, a large, oblique, pyriform spot on the sides of the basal half of the 2nd, the narrowed end at the apex, a trilobate line on its apex, a longish spot on the apex of the 3rd laterally, a trilobate band on the 4th, a large oval spot in the centre of the 6th and lines on the apices of the 2nd and 3rd ventral, both widely roundly dilated in the middle, yellow. Four front legs yellow, the 4 anterior coxæ and a line on the femora and tibiæ behind black, the hind coxæ, femora and apex of tibiæ black, the rest yellow. Wings hyaline, the apical half of the radial cellule fuscous violaceous, the nervures and stigma black, tegulæ yellow, with a fuscous spot before the middle. ♀.

Total length 8 mm.

Hab.—"Bombay".

Clypeus as wide as long, its apex wide, almost transverse, the puncturation strong, but not close; the puncturation on the front and vertex closer but not quite so strong. Base of thorax closer, the sides rounded. Pro- and mesothorax strongly, closely punctured, the post-scutellum less closely and less strongly punctured, its apex bluntly rounded. Metanotum short, almost vertical, the centre depressed. The 1st abdominal segment narrow at the base, becoming gradually widened towards the apex; the 2nd is clearly longer than it is wide at the apex, its basal half smooth, the apical not very strongly punctured; the apex of the 3rd is also punctured. Allied to *O. bipustulatus*. Sauss.
